Before the
Federal Communications Commission
Washington, D C. 20554

In the Matter of	)
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Advanced Television Systems	)
and Their Impact Upon the	) MM Docket No. 87-268
Existing Television Broadcast	)
Service	)

TO: The Commission

REPLY COMMENTS OF THE
ASSOCIATION FOR MAXIMUM SERVICE TELEVISION, INC.
ON THE FIFTH NOTICE OF PROPOSED RULEMAKING

August 12, 1996

TABLE OF CONTENTS

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I. SUMMARY AND INTRODUCTION

This reply to comments on the Commission's Fifth Further Notice of Proposed Rule Making (FCC 96-207, released May 20, 1996) ("Fifth NPRM" or "Notice"), is submitted by the Association for Maximum Service Television, Inc. ("MSTV") on behalf of more than 300 local television stations nationwide.[1/] We echo the plea of many for the Commission to facilitate the nation's transition to advanced digital television ("DTV") and oppose the request of a few for the Commission to poison that transition with chaos and confusion. The first path -- the path to universal and free access to DTV and worlds of digital information -- can be gained only if the Commission completes the process it began nine years ago by adopting the Advanced Television Systems Committee Digital Television Standard ("ATSC DTV Standard")

[1/] We filed initial comments jointly with a cross section of broadcast organizations. See Broadcasters' Comments on the Fifth NPRM (July 11, 1996) ("Broadcasters' Comments"). Due to the shortness of time, we file reply comments alone. All references to comments are to those filed in response to the Fifth NPRM, unless otherwise stated.

recommended by the Advisory Committee on Advanced Television Service ("ACATS"). Failure to adopt the ATSC DTV Standard would derail the transition and put the nation on the alternative path to a second rate television service by way of incompatible transmission technologies and consumer equipment.

Commenters to the Notice range from those with a keen interest and longstanding involvement in the development of a DTV transmission standard to those with little or nothing at stake in the nation's broadcast system. Computer industry commenters are the most notable members of the second group. They have weighed in with a mass of comments critical of the ATSC DTV Standard and a counter-proposal submitted by the *ad-hoc* Computer Industry Coalition on Advanced Television Service ("CICATS"). These reply comments address some of the problems with the CICATS proposal. Of course, the *most* detailed critiques of CICATS' notions may be found in the records of the ATSC and the more than 300 ACATS public meetings.[2/] These were the most hospitable fora for considering alternatives to the ATSC DTV Standard. The object of the entities at the front lines of the transition to DTV, with the greatest interest in having a flexible and interoperable transmission standard, is adoption of the ATSC DTV Standard to propel the rapid and successful spread of DTV and reassignment of broadcast spectrum.

[2/] See also Memorandum from Paul Misener to Fiona Branton (August 18, 1995) ("Misener Memo"), which addresses the contentions of Apple Computer that the Grand Alliance ATV system then under consideration by ACATS was insufficiently interoperable with computer applications. That memorandum concluded that "Apple's objections to the Grand Alliance ATV system . . . contain technical inaccuracies and/or misunderstandings of the tenets by which the FCC regulates television broadcasting, and a complete lack of consideration of the market economics and operation constraints that face the broadcasting industry. It is fair to say that Apple seeks a computer standard, not an interoperable broadcasting standard." Id., at 1. The same criticism could be leveled at CICATS with respect to its opposition to the DTV Standard, which documents the Grand Alliance system.

In sorting through the comments to the Notice, the obvious bears repeating: the goal of this proceeding is to transition the nation's free over-the-air television system to an advanced, spectrum efficient service capable of opening high definition television ("HDTV") and the byways of digital information to all Americans. Making this leap will require more than 1600 television stations to install new equipment and operate two stations simultaneously in the spectrum band currently used by half as many stations. It will require financial institutions to provide television stations with the necessary financing to make these investments. It will require equipment manufacturers to produce sets that consumers can afford and trust to be maximally useful throughout their lives. Finally, it will require program producers to create content for these new sets and consumers to purchase them.

The Notice deals with one critical piece of this transition -- the transmission of the television signal.[3/] Not surprisingly, those numerous entities with the greatest expertise in digital television technologies and, along with consumers, the largest stake in the successful dissemination of DTV have one view with respect to the necessity of adopting the ATSC DTV Standard. Those few commenters with little expertise and less stake in the transition take a different view. Broadcasters and consumer equipment manufacturers are the two sets of parties to this proceeding most intimately concerned with DTV signal transmission. As discussed below, these parties uniformly support FCC adoption of the ATSC DTV Standard. In addition, those responsible for the technical quality of the transmission standard -- the ATSC and the

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[3/] MSTV takes no position in these comments on the Fifth NPRM's proposals regarding protection from interference. See Fifth NPRM, at 20-23. We believe these issues are better addressed in connection with the next rulemaking on DTV allotments/assignments.

Advanced Television Technology Center ("ATTC") -- support FCC adoption of the ATSC DTV Standard.[4/] Even representatives of the program producing community, for whom signal transmission matters far less than picture display characteristics, support FCC adoption of the ATSC DTV Standard.[5/]

By and large, the only parties to object to FCC adoption of the ATSC DTV Standard are those with a minimal stake in (and perhaps a hostile position toward) the public's transition to DTV -- the computer and cable industries.[6/] As addressed in Section II below, the cable industry opposes *adoption* of the ATSC DTV Standard (not the ATSC DTV Standard itself) by and large because cable subscribers may not depend on over-the-air transmissions to obtain DTV.[7/] In effect, the cable industry commenters' opinion that a uniform transmission standard is not necessary rests on their indifference or opposition to the persistence of the public's broadcast service, which depends on a successful transition to DTV. A few in the computer industry stand even farther at the periphery of the transition to DTV. They quarrel with the ATSC DTV Standard *itself* (not FCC adoption of that standard) and propose untested and unproven alterations developed solely for the benefit of computer applications. These alterations, even if they worked, would prevent the public from experiencing HDTV at affordable prices and forever consign broadcast television to an inferior quality. Even mere

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[4/] See Comments of ATSC, at 2; Comments of ATTC, at 2.

[5/] See Comments of the Motion Picture Association of America ("MPAA") and Universal City Studios; but see Comments of Coalition of Film Makers.

[6/] We do not believe that these opposing adoption of the ATSC DTV Standard, ostensibly on behalf of consumers, properly grasp the harm that failure to adopt the ATSC DTV Standard would have on consumers.

[7/] See Comments of the National Cable Television Association ("NCTA"), at 13 n.20; see also Comments of Tele-Communications, Inc. ("TCI"), at 20.

consideration of these alternatives, to the extent that it delayed the roll-out of DTV, would impose serious lost-opportunity costs on the public. Notably, most computer companies have not participated at all in this proceeding and the only two who chose to participate in the ACATS process -- Digital Equipment Corporation and Microsoft -- voted to adopt the ATSC DTV Standard.

II. COMMENTERS RECOGNIZE THAT ADOPTION OF THE ATSC DTV STANDARD IS NECESSARY FOR A SWIFTLY EMBRACED AND TECHNICALLY EXCELLENT DTV SERVICE.

The commenters with the greatest knowledge of, and concern for, the transition to DTV join with the Broadcasters in urging the Commission to adopt the ATSC DTV Standard. These parties recognize that adoption of a transmission standard is critical to upgrading the nation's broadcast service with all deliberate speed and minimal disruption. They also recognize that the ATSC DTV Standard's unprecedented flexibility and breadth will permit this broadcast service to serve consumers best by supporting HDTV as well as evolving digital applications and by leading the world in broadcast technical excellence.

A. ADOPTION OF THE ATSC DTV STANDARD IS A MANDATORY PREDICATE TO THE TRANSITION TO DTV.

Consumer equipment manufacturers[8/] and retailers,[9/] motion picture industry representatives,[10/] and the Clinton Administration[11/] agree with the

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8/ See, e.g., Comments of the Digital HDTV Grand Alliance; Electronic Industries Association, at 6-8 ("Grand Alliance"); General Instrument Corporation, at 2-4; Hitachi America, Ltd., at 3; Matsuhita Electric Corporation, at 2; Mitsubishi Consumer Electronics America, Inc., at 1-3; Philips Electronics North America Corporation ("Philips"), at 1-8; Sony Electronics, Inc., at 8-11; Thomson Consumer Electronics, at 4-5; Zenith Electronics Corporation, at 2-5.

9/ See, e.g., Comments of Circuit City Stores, Inc. ("Circuit City"), at 6.

10/ See, e.g., Comments of MPAA, at 4.

Broadcasters, broadcast engineers,[12] the ATSC[13] and the ATTC[14] that FCC adoption of the ATSC DTV Standard is the *sine qua non* of a successful transition to DTV.[15] What these commenters understand is that the introduction of DTV is unlike the roll-out of any other technology. Never before have consumers been required to purchase new equipment to continue to receive an existing service -- a non-discretionary service on which essentially all Americans rely for the delivery of information and entertainment.[16] The transition to DTV will pose an unprecedented challenge for the following reasons, among others: (1) the terrestrial broadcast transmission environment is uniquely unforgiving -- huge amounts of data must be crammed into 6 MHz channels and carried subject to destructive interference; (2) consumers must be induced to replace more than 200 million receivers; (3) broadcasters must be induced to build more than 1600 new stations; (4) broadcasters have no control over the speed with which consumers purchase new receivers; and (5) the transition must take place steadily and

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[11] See Comments of the National Telecommunications and Information Administration ("NTIA") ("Commission adoption of a transmission standard will provide certainty to consumers, broadcast licensees, and equipment manufacturers, which in turn will help alleviate the 'chicken and egg' problem inherent in adoption of any totally new system. The knowledge that equipment will not soon be rendered obsolete will encourage rapid investment in the new system, investment that is needed to facilitate the transition to digital...Adoption of a digital transmission standard promises to spur the American economy in terms of manufacturing, trade, technological development and international investment".)

[12] See Comments of Association of Federal Communications Consulting Engineers, at 2; Cohen, Dippel and Everist, T.C., at 4-5; Hammett & Edison, Inc., at 1.

[13] Comments of the ATSC, at 2-10.

[14] Comments of ATTC, at 2-4.

[15] Others agree that adoption of a transmission standard is necessary, although they disagree on the constituents of the standard that should be adopted. See, e.g., Comments of Consumer Federal of America and Media Access Project ("CFA/MAP"), at 2.

[16] See Comments of EIA, at 7; Fifth NPRM, at 15.

relatively quickly or the unified nationwide broadcast service could fracture. Adoption of the ATSC DTV Standard provides the nation with the essential tool to meet these challenges.

The central platform of those opposed to the adoption of the ATSC DTV Standard is that technological uncertainty should be celebrated and advancing transmission technologies permitted to unfold no matter what the resulting disruption to emerging markets. While this wait-and-see-do-nothing approach might work for technologies that (a) are not subject to broadcast spectrum contracts, or (b) can be rolled-out over time to small segments of the population and function in a closed system (where a single entity controls both the transmission and reception apparatus, like DBS or cable), and\or as subscription services in which investments are quickly recaptured,[17/] this approach would utterly ruin the upgrade of television broadcasting.

Numerous commenters affirm what the Commission recognized years ago: "[T]he existence of a single, national broadcast transmission standard is all that stands between our having a national television service and our having any number of closed, local or regional systems."[18/] The ATSC DTV Standard is that single national transmission standard that has emerged after nine years of testing and deliberation. Those opposed to adopting the ATSC DTV Standard would use the very success of this process to prevent its completion. They point to how far the technology has come and

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[17/] Comments of NCTA at 14-15; Comments of TCI at 4, 24-25; Comments of CICATS at 10. See also Comments of the Business Software Alliance, at 9 (attempting to draw comparisons between the growth of the software industry, which can beta-test products and then continually release improved versions to small segments of the population, with television broadcast transmission technologies which must be upgraded all at once and only once within the confines of a universally accepted standard so as to reach the entire population).

[18/] Comments of Philips, at 5.

ask rhetorically how much it might progress in the future, suggesting that this uncertainty should stop us from moving forward. Like gravity, evolving technology is a fact of life. But standard-setting bodies must persist with their work in the face of this fact. ACATS did not settle for an analog system but wisely extended the standard-development process until it could approve a digital standard. Digital transmission technologies were clear alternatives to analog in the early 1990's when the ATSC DTV Standard was being developed. No such superior technical alternatives now exist or are even on the horizon.[19/] The country cannot afford to wait for other technologies to come down the pike. Fortunately, because the ATSC DTV Standard permits enough technical innovation within its compass to satisfy future developments, the country does not need to wait.[20/] By all indications, the public, government, and industry are ready to get the DTV transition process underway; the broadly accommodating ATSC DTV Standard disposes of any reason to delay.[21/]

19/ The CICATS and other computer industry proposals recommend a paring down of the ATSC DTV Standard, on the basis of approaches that are unproven and untested in the terrestrial broadcast environment. Uncertain, expensive and entailing open-ended delay, their proposals fail the ultimate test -- the ability to make available to all Americans the highest quality service.

20/ Although the computer and cable industries argue that adoption of the ATSC DTV Standard would be wrong because we cannot know what technologies lie ahead, the computer industry appears blind to the possibilities that the technical abilities of its own constituency could evolve so as to make better use of the DTV Standard. See Comments of the Grand Alliance, at 21 (describing computer company joint ventures involving the provision of information services via DBS and other television delivery media that use interlace scanning).

21/ One wonders what TCI has in mind when it urges the Commission to allow technology to "settle down" and allow a *de facto* standard to emerge. See TCI Comments, at 10. According to the computer industry, technology is unlikely ever to settle down. If the nation's broadcast television service is ever to upgrade, broadcasters and equipment manufacturers will have to begin the process using a single transmission standard. Now is as "settled" as the technology will ever be. The DTV Standard is as good as a broadly supported and fairly arrived at standard will ever be.

Adopting the ATSC DTV Standard now is as important as adopting the NTSC standard was forty years ago. Then, confusion in television transmission and reception technologies could have waylaid the introduction of a new service that depended on the creation of new infrastructure and consumer demand. Today, the introduction of DTV similarly will depend on the erection of new infrastructure across the country and the purchase of new receivers. But now, as never before, broadcasters will be subject to competition from video delivery mechanisms not similarly burdened by spectrum constraints and not similarly obliged to reach the entire American public. Serious glitches in the roll-out of DTV due to conflicting transmission technologies or undue delay would hand over the video market to subscription services. Sony Electronics, which manufactures both professional broadcast and consumer equipment, is well-qualified to assess the importance of relative certainty to the roll-out of DTV. It notes that because "competitive business uncertainties abound [, o]nly a mandate can provide the requisite degree of certainty and security for all interested parties that will insure the swift introduction of HDTV. It will set a direction and establish rules for different entities -- all crucially dependent on each other -- content providers, broadcasters, manufacturers, consumers, investors, and others."[22/]

B. THE INTEGRITY OF THE FCC'S PROCESS REQUIRES ADOPTION.

The Commission, under the approving oversight of Congress and various Presidential administrations, recognized the importance of adopting a DTV transmission standard in 1987 when it launched the ACATS process, in 1988 when it stated that the

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[22/] Comments of Sony Electronics, at 8. As a manufacturer of computer and computer peripheral equipment, Sony Electronics can be expected to value interoperability in the DTV Standard as well as the certainty to which an adopted standard contributes. See also, Comments of Circuit City, at 6.

public interest compels a Commission role in the development of standards,[23] again in 1990 when it stated its intention to select a single high definition television system in a public notice[24] and in its Memorandum of Understanding with ACATS and the ATTC, and again in 1996 when it proposed to adopt the ATSC DTV Standard. Broadcasters and equipment manufacturers made significant investments of funds and good will acting in reliance on ultimate Commission adoption of the ATSC DTV Standard. We agree with those commenters that suggest that this reliance is not reason enough to adopt the ATSC DTV Standard. Enabling the transition to DTV without undue pain to consumers is the reason to adopt the ATSC DTV Standard. But the Commission should not lightly disregard the trust that the relevant industries, ACATS, and the ATSC vested in the Commission's promise to adopt a single transmission standard at the end of the industry and governmental collaborative process.

First, this trust is what fostered the industry consensus behind the ATSC DTV Standard. There is no guarantee that outside of the shadow of Commission action, the industries now willing to go forward with the ATSC DTV Standard would not splinter off with various proprietary and incompatible technologies.[25] Second, reneging

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[23] See Tentative Decision and Further Notice of Inquiry in MM Docket No. 87-268, 3 FCC Rcd. 6520, 6534 (1988).

[24] See First Report and Order in MM Docket No. 87-268, 5 FCC Rcd 5626, 5628 (1990).

[25] See Comments of the Grand Alliance, at 8 ("[T]he Commission's clear intention to select a single standard was fundamental to its decision to form the Advisory Committee, was central in motivating the Advisory Committee and the HDTV proponents to encourage and to form the Grand Alliance, and was essential in driving the subsequent actions of ATSC and the Advisory Committee to forge a consensus around a broadened ATV standard . . .Removing the assumption that the Commission would mandate a single standard would constitute an eleventh-hour reversal of the Commission's policy, and would threaten the industry consensus and inject a great deal of uncertainty, risk and delay into the process, jeopardizing a swift transition to digital television and the rapid recovery of valuable television spectrum.")

on the promise to adopt a standard because this consensus exists, as some propose,[26] would undermine the process and reduce any chance of assembling such a consensus in the future. As General Instrument notes, "[i]ndustry shouldered the burden of minimizing technical uncertainty with the expectation that the Commission would shoulder the burden of minimizing marketplace uncertainty . . .the path to a single digital TV standard would have been much different if the stakeholders had not expected the Commission to adopt a standard."[27] The integrity of the Commission's process in addition to the necessities of the transition to DTV require adoption of the ATSC DTV Standard.

C. THE PARTICULAR CHARACTERISTICS OF THE ATSC DTV STANDARD QUALIFY IT FOR ADOPTION.

The record is replete with evidence of the ATSC DTV Standard's excellence, particularly with respect to its flexibility,[28] extensibility,[29]

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[26] See, e.g., Comments of TCI, at 6-8; Comments of NCTA (Owen Declaration, at ¶ 32).

[27] Comments of General Instrument, at 5.

[28] See, e.g., Comments of EIA, at 9 ("All digital technology is, in theory, infinitely flexible. Without an agreed-upon DTV standard, future innovation would actually be stymied by disorder. The ATSC DTV Standard eliminates the threat of technological anarchy by providing a baseline for innovation. By creating a common DTV syntax, the Standard systematizes how the flexibility of digital technology can be utilized within the DTV environment. This flexibility, in turn will fuel competition in the development of new and innovative video programming and other service offerings, as well as consumer electronics equipment.")

[29] See, e.g., Comments of Matsushita Electric, at 9 ("The flexible, packetized structure of the ATSC ATV system will allow new applications such as digital data broadcasting to be developed and deployed. Thus, ATV could be a catalyst to the NII's further development and the creation of new NII applications. Together, the ATSC ATV standard's layered architecture, packetized data transport structure and use of headers and descriptors provide a system of the greatest flexibility, enabling unlimited applications in services that are familiar today and those not yet imagined.")

interoperability,[30] and capacity to lead the world.[31] Section III below explores these characteristics in the context of the specific criticisms of the ATSC DTV Standard. The narrow point we make here is that the consumer benefits conferred by this particular transmission standard vastly outweigh any perceived negatives. The adoption of any single standard would confer the benefits of certainty and justify consumer confidence in the transition to DTV. This particular standard will, in addition, ensure that the transition to DTV is a transition worth making. It will ensure that all television stations will be able to transmit digital signals,[32] that consumers will have a fair chance to view HDTV on reasonably priced sets,[33] and that other popular programming options will be universally available.

Whereas the making of the ATSC DTV Standard was open, inclusive, and thorough, the creation of the CICATS proposal was closed and hasty. CICATS did not

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[30] See, e.g., Comments of ATSC, at 17-28; Comments of MPAA, at 5 ("The system's all-digital layered architecture, its packetized data transport structure, its use of headers and descriptors, its support of multiple picture formats and frame rates with a heavy emphasis on progressive scan and square pixels, and its compliance with MPEG-2 international compression and transport standards, give it unprecedented, unmatched interoperability with computers and telecommunications.")

[31] See, e.g., Comments of NTIA, at 2 ("Failure to adopt a U.S. standard may mean that competing systems -- such as the Digital Video Broadcasting (DVB) system, developed by a consortium of European broadcasters electronics companies, and telecommunications organizations -- will win the race for worldwide acceptance.")

[32] What some, particularly in the computer industry, ignore is that the DTV Standard was constructed so as to operate on tightly packed 6 MHz channels. Any significant variation in the standard will change the interference contours of more than 1600 stations and therefore the appropriate DTV channel assignments for these stations.

[33] It is worth noting that in 1960, when the Kennedy-Nixon presidential debates marked the blossoming of the new broadcast television service, an average-sized TV set of average quality was advertised for $200 - $250, according to Consumer Reports. According to the Consumer Price Index, this amounts to $1066-$1,332 in 1996 dollars. Thus, the predicted prices for the early generations of DTV sets are close to the prices for the early generations of NTSC sets. The value the DTV sets will give the consumers, of course, is far greater.

hold open meetings. It did not even solicit broadcaster input to what is, after all, a broadcast transmission standard. It conducted no tests in a broadcast environment and invited no public review. These flaws of process and structure are reflected in, but pale beside, the flaws of substance in the CICATS proposal.

The CICATS proposal would denude the ATSC DTV Standard of its HDTV format, which could not be transmitted across the CICATS "base-line" standard within a 6 MHz channel.[34/] As a result, only the highest-end consumer equipment, if any, would come equipped with HDTV decoding and display capabilities. This eventuality would rob the mass of the public of the benefits of HDTV at an affordable price. Moreover, it is unlikely that HDTV would ever be transmitted over the air for the fractional audience that would be capable of watching it. The transition to DTV is a gamble for all concerned. Limiting DTV to standard definition television would reduce the odds of a successful transition and make broadcasters question the wisdom of investing millions of dollars to upgrade each of their stations simply to transmit only marginally better pictures. Moreover, limiting DTV to standard definition would put consumers to the significant expense and trouble of purchasing new receivers to get little more value than is now available over analog television.[35/] The computer industry would undoubtedly benefit from such a low-grade digital conversion, but the consumer would be charged for no added television value. It would be an unhappy development

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[34/] See Comments of CICATS, at 31-33 and Exhibit B.

[35/] The software industry model is based on consumers' purchasing upgrades every two to three years. Services are layered and geared to different levels of consumer investment and wealth. Broadcast television has never, and should never, work this way. Rather, the broadcast model makes free, universal, and high quality service available to the entire public on spectrum allocated for this purpose.

if, after so many years of nurturing the development of HDTV and emphasizing the importance of its eventual transmission, the Commission adopted a transmission standard that doomed HDTV.

As part of its "simplification" of the ATSC DTV Standard, the CICATS proposal would also jettison the single interlaced format in the ATSC DTV Standard.[36/] While one would expect criticism from some in the computer industry (addressed in Section III, below), who believe this format to be sub-optimal for their own uses, it is surprising to hear such criticism from some purported consumer representatives.[37/] This criticism must be based on a failure to appreciate that the interlaced format and the ability to convert that format to a progressive display add virtually nothing to the cost of a DTV set. A set uses the same technology to de-interlace a signal that it does to decompress that signal. But having the interlaced format permits the use of existing consumer electronics equipment such as camcorders and VCRs to support the production of low-cost programming.[38/] The inclusion of interlaced standard definition television formats in the ATSC DTV Standard also increases the capacity of local broadcasters to use their installed base of NTSC production and studio equipment to deliver educational and community service programming until they can upgrade their equipment. Without the interlaced format, local broadcasters would have to place increased reliance on

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[36/] The U.S. transmission standard deliberation process does not take place in a vacuum. Ironically, failure to adopt the DTV Standard because of the computer industry's opposition to the interlaced format, among other reasons, would likely clear the field for Europe's Digital Video Broadcasting system which supports *only* interlaced formats, uses non-square pixels, and is not even minimally interoperable with computer applications. See Comments of Philips Electronics, at 15.

[37/] See Comments of CFA/MAP, at 2; but see Comments of the National Consumers League, at 1 (supporting adoption of the ATSC DTV Standard).

[38/] See Comments of the Grand Alliance, at 22.

network or syndicated programming. Given the Media Access Project's endorsement of community broadcasting over the DTV channel in comments to the Fourth Further Notice of Proposed Rulemaking (released in the above-captioned docket on August 9, 1995), that organization's objection to this aspect of the ATSC DTV Standard is baffling and disappointing.[39/]

III. THERE IS NO CREDIBLE OPPOSITION TO ADOPTING THE ATSC DTV STANDARD.

Those in the cable, computer and motion picture industries that oppose adopting the ATSC DTV Standard, or adopting any standard at all, virtually ignore the central point of adopting a standard -- enabling the transition to digital television. These dissenters would have the Commission cater to their respective industries' parochial needs at the expense of the swift, economical and efficient transition to digital television, and the quality and viability of the public's free broadcast television service. The ATSC DTV Standard strikes the best possible balance between implementing the transition to digital television while preserving technological flexibility and growth opportunities. The ATSC DTV Standard also is designed to be as interoperable as possible without sacrificing its main goal -- a successful transmission to advanced television.

A. THE CABLE INDUSTRY'S OBJECTIONS TO ADOPTING ANY STANDARD ARE HASTILY CONCEIVED AND UNFOUNDED.

The cable industry's newfound opposition to adopting a digital television standard runs counter to the industry's heavy involvement in the ACATS and ATSC processes. As many commenters to the Notice agree, the ATSC DTV Standard was developed through a uniquely open and inclusive process that included representatives of

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[39/] See Comments of Media Access Project (November 20, 1995).

the cable industry at every critical stage.[40/] This process, which began in 1987 when the Commission established ACATS to recommend a national standard after evaluating candidate transmission systems, allowed all interests, including the cable industry, to fully participate. In 1988, when broadcasters contributed an objective and scientific forum for the ACATS-sponsored competition among digital and analog systems by establishing the ATTC to test competing prototype equipment, the cable industry lent substantial support to the effort. The testing, design and execution were open to *all* interested parties including the cable industry. Notably, Cable Laboratories participated in ATTC Board meetings, shared ATTC lab and office space, and conducted the cable portions of ACATS' lab and field testing program.[41/] Cable industry representatives saw the ATSC process through to its end -- Home Box Office and the NCTA ATSC members, were responsible for documenting the ATSC DTV Standard.

The cable industry has consistently recognized the value of standards within a regulatory context -- a fact that further diminishes the credibility of that industry's current opposition to adoption of the ATSC DTV Standard. In comments in ET Docket No. 93-7[42/] the cable industry joined the consumer electronics industry to affirm the need "'to standardize the system used for digital [cable] transmission.'"[43/] The joint cable-consumer electronics industry comments also acknowledged that "a firm

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[40/] See, e.g., Comments of ATSC, at 3-6; Comments of Philips, at 12-13.

[41/] See Fifth NPRM, at 3.

[42/] See Implementation of Section 17 of the Cable Television Consumer Protection Act of 1992 -- Compatibility Between Cable Systems and Consumer Electronics Equipment, First Report and Order, 9 FCC Rcd. 1981, 2004-05 (1994).

[43/] Comments of Cable-Consumer Electronics Compatibility Advisory Group, ET Docket No. 93-7, at 22 (Jan. 25, 1994) (quoting Implementation of Section 17 of the Cable Television Consumer Protection and Competition Act of 1992, 8 FCC Rcd. 8495, 8501 (1993)).

understanding that digital standards will be prescribed is essential to provide assurance to consumers and legislators against a recurrence of the kinds of [cable compatibility] problems that led to the adoption of Section 17" of the Cable Act.[44/] The two industries accordingly informed the Commission that they were "anxious to move ahead with joint recommendations on digital standards as quickly as possible."[45/]

The cable industry now objects not only to adoption of the ATSC DTV Standard but to the adoption of *any* transmission standard.[46/] These objections are self-serving and unfounded. NCTA, for example, proposes that the FCC not adopt the ATSC DTV Standard because it will influence the development of subscription television technologies. Admitting that the NTSC transmission standard was "arguably necessary to develop a national broadcasting system," NCTA would sacrifice whatever benefits that adopting a transmission standard would confer on the public's advanced broadcasting system because "nearly 70 percent of Americans receive their television programming

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[44/] Id.

[45/] Id. at 23. Responding to these comments, the Commission found that a digital cable transmission standard is in the public interest:

> We recognize the need to proceed with caution in this area and to ensure that our processes and regulations do not unnecessarily impair the development of new cable technologies and services and of appropriate interfaces between such technologies and services with other media. *Notwithstanding these considerations, we find that standards for cable digital transmissions are necessary to avoid future compatibility problems when cable systems use digital transmission methods, and to allow the mass production of economical consumer equipment that is compatible with cable digital services.*

Implementation of Section 17 of the Cable Television Consumer protection Act of 1992 -- Compatibility Between Cable Systems and Consumer Electronics Equipment, First Report and Order, 9 FCC Rcd. 1981, 2005 (1994) (emphasis added).

[46/] See Comments of NCTA, at 2. ("Our comments should not be read to be critical of the particular DTV standard recommended by the [Advisory Committee]. It is whether any standard should be dictated by government -- not the standard itself -- to which our concerns are directed."). See also Comments of TCI, at 21-22.

not from over-the-air broadcasting but from a variety of alternative video delivery systems."[47/] There is no evidence that cable or other television service subscribers will suffer from the adoption of the ATSC DTV Standard. In fact, most of these viewers rely heavily on broadcast television programming and use at least one over-the-air television set. They, like Americans who rely exclusively on the over-the-air television service, stand to gain immensely from adoption of the ATSC DTV Standard.

Representatives of the cable industry also argue that a government adopted standard would freeze technology and retard innovation, particularly because digital technology is in a "nascent stage of development."[48/] Instead, they advocate relying on market forces to produce a standard.[49/] The cable industry's assertions that adopting a standard will arrest technological innovation are entirely unjustified in light of the ATSC DTV Standard's hospitality to growth.[50/]

Commenters to the Notice agree that fears that adopting the ATSC DTV Standard will freeze technology or thwart innovation are unwarranted as the system was expressly intended to allow future flexibility, innovation, and improvement.[51/] The very

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47/ Comments of NCTA, at 13 n.20.

48/ Comments of TCI, at 8-11; see also Comments of NCTA, at 7-9.

49/ Comments of NCTA, at 7; Comments of TCI, at 4-6.

50/ Part of the cable industry's misapprehension lies in its flawed assumption that digital technology is in its infancy when in fact the digital compression techniques that underlie the ATSC DTV Standard are as many as ten years old. See Comments of Hitachi America, Ltd., at 5; but see Fifth NPRM, at 14.

51/ See, e.g., Comments of ATTC, at 5-8 ("[F]ears that adoption of the [DTV] Standard now will freeze the state of the art or erect barriers to technological innovation are unjustified. There is ample room for new ideas to be introduced, without introducing the risk of a Tower of Babel that might result if the ATSC Digital TV standard is not approved or mandated."); see also Broadcaster Comments, at 6-15.

design of the ATSC DTV Standard, which ensures flexibility and "headroom," is sufficient to meet the cable industry's concerns about allowing continued technological innovation. The ATSC DTV Standard maintains the flexibility for simultaneous delivery of multiple programs in a standard definition format while allowing the broadcast of programs in high definition format. Its flexibility is manifested in several ways -- it utilizes a layered architecture; it is compatible with the international MPEG-2 video compression and transport standard; and it offers 14 different video formats, including multiple refresh rates and scanning modes. In fact, a technological freeze might result if the Commission *failed* to adopt the DTV standard.[52/]

Despite cable industry representatives' comments to the contrary, adopting a digital television standard does not counter either the letter or spirit of the Telecommunications Act of 1996.[53/]

We wholeheartedly agree with cable industry commenters that the 1996 Act's driving force is "to accelerate rapidly private sector deployment of advanced telecommunications and information technologies to all Americans."[54/] In order for broadcasters to take maximum advantage of the 1996 Act's procompetitive promise and remain competitive with other video delivery systems, they must transition to the digital mode of transmitting television service. Only adoption of the ATSC DTV Standard will

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[52/] See, e.g., Comments of Philips, at 8. ("[T]he demise of AM stereo serves as a strong warning that the failure to adopt universally employed broadcast standards results in confusion in the marketplace, significantly diminished market penetration, and ultimately, the death of that new technology.")

[53/] NCTA maintains that standardization is contrary to the deregulatory and procompetitive spirit of the 1996 Act. See Comments of NCTA, at 18-19.

[54/] See Comments of NCTA, at 18-19; see also Comments of TCI, at 22 (quoting Conference Report, Telecommunications Act of 1996, Report 104-458, 104th Cong. 2d Sess. at 1.)

ensure the swift and sure transmission to digital television. Blindly imposing an unproven or arbitrary standard upon the marketplace *would* be inconsistent with the Act's procompetitive and deregulatory bent. But the ATSC DTV Standard has been tested, proven, and endorsed by the industries it will most affect. As the record amply shows, the nine year well-documented process that led to the ATSC DTV Standard was anything but arbitrary.

Cable and computer industry commenters urge the Commission not to adopt a digital television transmission standard simply because the FCC has not adopted standards for services such as PCS, MDS, and MMDS.[53/] Analogies between these services and broadcast television are inapposite at best. PCS, MDS and MMDS are subscription and cost-based services whereby the licensee controls both the transmission and reception equipment.[54/] Unlike television, none of these services is a free over-the-air, universally available service on which Americans historically have relied for information and entertainment. Commenters agree that in the broadcast television context, the need for certainty and reliability is greatly enhanced.[55/] Without assurances to consumers that their equipment will function broadly -- assurances that can only be made by adopting a standard -- the smooth transition to digital television will be compromised.

[53/] See, e.g., Comments of NCTA, at 14-18; Comments of TCI, at 4; Comments of the Business Software Alliance, at 7; Comments of CICATS, at 10.

[54/] The implications of the ability to control both the transmitting and receiving equipment are discussed in MSTV's "Comments Submitted for the FCC March 5, 1996 En Banc Hearing on Spectrum Policy" (February 20, 1996), at 14-16.

[55/] See, e.g., Comments of ATSC, at 7.

The cable industry's position, may be based on a desire to lock broadcasting into its current, increasingly second-class technology. In the Commission's proceeding on competition in the video programming marketplace (CS Docket No. 96-133), NCTA pointed to over-the-air broadcasting as a competitive force that exerts constraints on cable pricing to consumers and the cable industry's development of program offerings. Sabotaging its competitor's ability to transition to DTV would be an effective way to reduce broadcasting's salutary competitive impact on the video marketplace. Cable may also fear that establishment of a standard for broadcast transmissions would lead to pressure for a single television/cable standard or at least cable technology that is compatible with over-the-air television. This, of course, is a separate issue that can be, and is being, debated on its own merits.

B. THE CONCERNS OF SOME IN THE COMPUTER INDUSTRY ARE PAROCHIAL AND MISPLACED.

Like the cable industry, part of the computer industry now dissents from a consensus it played a significant role in shaping. The computer industry was represented in the ACATS and ATSC processes and ACATS' computer industry members voted to recommend the ATSC DTV Standard to the Commission. Despite this involvement, some computer industry representatives now suggest that a digital television transmission standard should not be adopted because the computer hardware and software industries "have thrived in the absence of government imposed standards."[56/] Again, the analogies proposed by critics of the ATSC DTV Standard are unhelpful. The computer hardware and software markets are elite and niche markets which have been able to

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56/ Comments of the Business Software Alliance, at 8-10; see also Comments of CICATS, at 11.

afford a protracted roll-out of technology. Consumers of computers select from yearly introductions of the newest in hardware and software. By contrast, neither broadcast television consumers nor broadcasters themselves can afford to replace television equipment at the same rate nor gamble on the likelihood that incompatible or quickly obsolete technologies will fragment the market. Broadcast television, unlike computer applications, requires nothing less than universal reach to succeed.

The computer industry's criticisms that interlaced scanning will adversely affect picture quality and interoperability are both narrow and baseless. Commenters recognize that inclusion of interlaced scanning in the ATSC DTV Standard as an option, at least at the beginning of the transition process, will have no ill-effect on the interoperability of computers and television.[57/] To the contrary, the experts in evaluating the technical components of the ATSC DTV Standard -- commenters representing the equipment manufacturing industry -- praise the inclusion of interlaced scanning as a technologically acceptable alternative that only enhances the flexibility of the ATSC DTV Standard.[58/] Recognizing the importance of interoperability from the outset, the ACATS process identified the technical factors that affect interoperability. The ATSC DTV Standard supports six combinations of pixel format and frame rates for HDTV. Progressive scanning is used in every combination of picture format and frame rate except for one HDTV format of 1920 x 1080 at 60 MHz. As we noted in our initial

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[57/] See, e.g., Misener Memo, at 3; Comments of Sony, at 14-16 ("Simplistic doomsday conclusions, therefore, that a preliminary interlace transmission implementation will permanently obviate a future incorporation of a progressive 'superset' have no technical basis whatever."); Comments of Hitachi, at 4; Comments of Mitsubishi Consumer Electronics America, Inc., at 2-3.

[58/] See id.

comments, including interlaced scanning as an option accommodates broadcasters who prefer its applications while still accommodating others in the broadcast, computer and film industries that prefer progressive scanning.[59/]

In its Notice, the Commission highlighted the deficiencies of the computer industry's argument that the ATSC DTV Standard should be limited to include only progressive technologies; the Commission wisely placed the burden on opponents of the ATSC DTV Standard.[60/] The computer industry has not come close to carrying that burden with respect to interlaced scanning and has confused the issue by masking concerns about display protocols as concerns about transmission protocols.[61/] Computer industry critics either do not grasp or simply will not acknowledge that five of the six HDTV scan formats in the ATSC DTV Standard are progressive and even material that is transmitted using the only interlaced format may be displayed in progressive format.

Some computer industry representatives criticize use of a 60 Hz display rate, arguing that 60 Hz will not allow the display of high resolution text and graphics and will complicate conversion of transmission rates for computer applications.[62/] Again the computer industry confuses display and transmission issues; "[t]he notion that a transmission frame rate is tied to display frame rates is an obsolete technical concept."[63/] Since the computer industry itself has not adopted a standard for display

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59/ See Comments of Broadcasters, at 11.

60/ See Fifth NPRM, at 18-20.

61/ See, e.g., Comments of ATSC, at 20-21; Comments of MPAA, at 6.

62/ See, e.g., Comments of Microsoft Corporation, at 8.

63/ See Misener Memo, at 4.